What Are We Made Of?
Student Activity Sheet

Elements

1. What are the elements that make up water?

2. What are some of the elements that make up Earth's atmosphere?

3. Why is carbon dioxide not an element?

4. Write a definition of an element using your own words.

Elements of the Human Body

5. Match the name of the element with the correct symbol.

C	Hydrogen
H	Nitrogen
O	Carbon
P	Iodine
K	Potassium
I	Phosphorous
N	Oxygen
S	Sodium
Ca	Chlorine
Fe	Iron
Mg	Magnesium
Na	Sulfur
Cl	Calcium

Elements on Earth

6. Use the following chart to answer questions a, b, & c.

Element	Symbol	Relative % on Earth
Oxygen	O	46.6
Silicon	Si	27.7
Aluminum	Al	8.1
Iron	Fe	5.0
Calcium	Ca	3.6
Sodium	Na	2.8
Potassium	K	2.6
Magnesium	Mg	2.1
Titanium	Ti	0.4
Hydrogen	H	0.1

   a. Which is the most abundant element found on Earth?

   b. How does the amount of Iron compare with the amount of Aluminum?

   c. Compare the amounts of Sodium and Potassium found on Earth.

7. How do you think we could determine the abundances of elements from an object in space, such as the Sun?

Elements From the Sun

8. As directed by your instructor, obtain a sample from the container in your plastic cup. Count the number of each color in your sample and record your results in one of the group columns below. You will have an opportunity to complete the remaining group columns when the class shares their findings.

COLOR	ELEMENT	GROUP 1	GROUP 2	GROUP 3	GROUP 4	GROUP 5	Material Reference #
Yellow	*Wafer material*						
Orange	*Neon (Ne)*						
Blue	*Magnesium (Mg)*						
Green	*Nitrogen (N)*						
Red	*Oxygen (0)*						
Total							

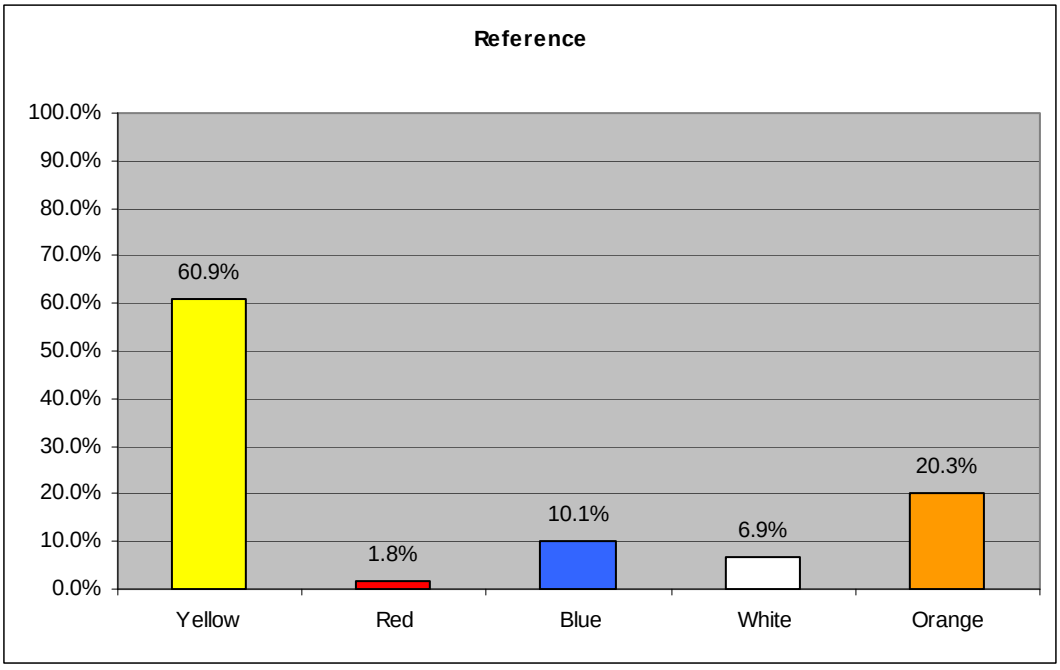
My Group's Percentage of Each Color Found in the Sample Extraction

9. Use the information from the data table that each student in your group recorded to make a graph showing their percentages. Then make a combined group graph using the total percentages.

10. Using the information in your table, contribute to a combined classroom graph and answer the following questions:

a. How did each of your elemental abundances compare with other groups?

b. Which graph do you think is a better representative sample of the solar wind in the wafer? Why?



This reference graph is based on the following totals:

2160 yellow representing the wafer materials (three large bags of 720) or 60.9 percent of total
720 orange representing neon one large bag of 720) or 20.3% of total
360 blue representing magnesium (one half large bag of 720) or 10.1% of total
245 green representing nitrogen (one small bag of 245) or 6.9% of total
64 red representing oxygen or 1.8% of total

Your class reference might be different. Check with your teacher.

c. What will the results from the Genesis mission science analysis tell us about our solar system? Hint: What did you do in the activity?

Elements of the Planets

The following table reveals the types and percentage of atmospheric gasses for some of the planets in our solar system. Study the table and then answer the questions that follow.

Planet	Atmospheric Constituents[1]
Mercury	He (42%), Na (42%), O_2(15%)
Venus	CO_2 (96%), N_2 (3.5%);
Earth	N_2 (78 %), O_2 (21%), H_2O (1 %), Ar (.93 %)
Mars	CO_2 (95 %), N_2 (2.7 %), Ar, (1.6 %), O_2 (.13%)
Jupiter	90% H_2, 10% He, .0001% H_2O, .02% CH_4,.03% NH_3,
Saturn	94-97% H_2, 3% He, 0.2% CH_4, 0.03 NH_3,
Uranus	83% H_2, 15% He, 2% CH_4,

11. Are the **types** of elements and molecules found in these planetary atmospheres similar or different?

Explain:

12. Are the **percentages** of elements and molecules found in these planetary atmospheres similar or different?

Explain:

13. If each of these planets originated from the same solar gas and dust, why is learning the amounts of each element in the sun important to understanding the solar system?

[1] Beatty, J.K., Chaikin, A., & Collins Petersen, C. (Eds.). (1999). *The new solar system* (4th ed.). Cambridge, MA: Sky Publishing Corporation.

Smoluchowski, R. (1984). *The solar system: The sun, planets and life.* New York: Scientific American Library.